Eagle Point Bridge
Between Dubuque, Dubuque Co., Iowa
and Grand Co., Wisconsin

HAER No. IA-2

HAER
IOWA,
31-DUBU,
3-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
NATIONAL PARK SERVICE
DEPT. OF THE INTERIOR
WASHINGTON, D.C. 20243

# THE

# DUBUQUE AND WISCONSIN BRIDGE

# (EAGLE POINT BRIDGE)

Dubuque, Iowa - Grant County, Wisconsin

An Historic American Engineering Record
Documentation Project

Prepared by

Dennett, Muessig & Associates, Ltd.
Iowa City, Iowa

for

Iowa Department of Transportation
Ames, Iowa

1982

HAER
IOWA,
31-DUBU,
3-



HISTORIC AMERICAN ENGINEERING RECORD

Dubuque and Wisconsin Bridge
(Eagle Point Bridge)
Dubuque, Dubuque County, Iowa

| | |
|---|---|
| Location: | Spanning the Mississippi River between Dubuque, Iowa and Grant County, Wisconsin, below Lock and Dam No. 11. |
| UTM: | West end: 15/693390 4711860 East end: 15/693900 4712100 |
| Quad: | Dubuque North, Iowa--Wis.--Ill. |
| Dates of Construction: | Four through truss spans (two Pratts and two Pennsylvania/Camelbacks) erected 1901-1902. Baltimore deck truss added 1906-1907. Three skewed Pratt through trusses added 1935-1936. |
| Owner: | State of Iowa. |
| Use: | Vehicular bridge. |
| Statement of Significance: | Eagle Point Bridge was the fifth Mississippi River bridge to Iowa to be erected exclusively for vehicular (i.e. wagon and pedestrian) traffic, and is the only one of the first five still standing. It was built for the Dubuque and Wisconsin Bridge Company, with funds raised through stock subscriptions in Dubuque's north end and in Grant County, Wisconsin. The original designer was Edward Clapp Shankland, who is best known for his work as chief engineer of construction at Chicago's World's Columbian Exposition of 1893. |
| Project Information: | The Dubuque and Wisconsin Bridge was documented by Dennett, Muessig & Associates, Ltd. (Iowa City, Iowa) for the Iowa Department of Transportation in 1982. The project team consisted of Robert A. Ryan and J Ceronie, Photographers; and Martha H. Bowers and Hans Muessig, Historians. |

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

We wish to thank the following individuals for their assistance during the course of this documentation project: Joseph A. Rhomberg, Jr., Helen Mercer, Charles Glab, and Duncan Glab, all residents of Dubuque; Robert Klein, Wahlert Library, Loras College, Dubuque; Gerald Ensler, Dubuque County Historical Museum, Dubuque; Ruth Paine, Dubuque Telegraph-Herald; Roy Eichhorn, District Archaeologist, U.S. Army Corps of Engineers, Rock Island, Illinois; Joseph J. Sherrer, P.E., Modjeski & Masters, Consulting Engineers, Mechanicsburg, Pennsylvania; and Clement Kachelmyer, Minnesota Department of Transportation, St. Paul.

## DESCRIPTION

The Dubuque and Wisconsin Bridge, commonly called Eagle Point Bridge, is an eight-span steel highway bridge over the Mississippi River between Dubuque, Iowa and Grant County, Wisconsin. Located some 300 yards below Lock and Dam No. 11, Eagle Point is one of three Mississippi River crossings from Dubuque. The others are the Illinois Central Railroad Bridge (rebuilt in the 1890's), the Julien Dubuque Highway Bridge (1941-43), and City Island Bridge (scheduled to open in 1982). Eagle Point Bridge is situated at the extreme north end of the city, off the neighborhood known as "the Point." It functions basically as an extension of Rhomberg Avenue, which runs northeasterly from the city center.

The present aspect of Eagle Point Bridge is the result of at least four major building programs. The first, in 1901-1902, saw erection of two Pennsylvania through-truss spans over the navigable portion of the main channel with a Pratt through truss at either end. The westernmost span butted directly against the limestone bluff of Eagle Point (from which the bridge derives its popular name), while the easternmost span was connected to a wood trestle approach over 1900 feet long that curved through backwaters and over low islands to the Wisconsin shore. In 1906-1907, a Baltimore deck truss was added to the eastern end of the main bridge, thereby extending the elevated portion of the structure all the way across the main channel. The east approach was realigned, and the wood pile bents replaced with steel bents, in 1922. In 1935-36, the U.S. Army Corps of Engineers added three Pratt trusses and a short plate-girder approach span

to the east end, thereby eliminating the remainder of the trestle approach. Unlike the first five spans, which were erected at right angles to the main channel current, the last three spans were skewed to the northeast, generally following the alignment of the trestle approach. In the mid-1940's, reinforcing rods were added to bottom chords and main diagonal tension members of the first five spans, and channel beams were welded to top chord sections to provide further stiffening for the trusses.

The west (Dubuque) approach is an extension of Rhomberg Avenue cut along the side of a high limestone bluff. The river edge of the approach roadway is marked by a wall of rockfaced limestone, which although appearing rather low from the roadway is actually the upper portion of a high retaining wall built up from near the base of the bluff. The west abutment is cut out of the cliff and faced with roughly-dressed limestone blocks. The fixed shoes of the first span sit on a narrow dressed-stone ledge.

There are three toll houses on the Iowa approach. The oldest of the three (no longer used as such) is located on the outer edge of the curve onto the bridge. It is a low, one-story brick structure with side-gable orientation and a steep roof with widely-overhanging eaves. The only decoration is the pattern of brickwork at the corners, slightly advanced to suggest quoining. The southeast-facing entrance features a door with three recessed panels below a nine-light window. To the left is a single 6/6 double hung sash window. A few yards below this building are a pair of modern (1975) toll booths, the lane between them reversible as traffic requires.

Once on the bridge, traffic moves at an incline of slightly over 4% across the first span. The roadway is level over the two navigation-

channel spans, then begins a gradual descent (less than 5%) over the remaining spans. At the east end of the Baltimore deck truss span, the roadway angles northeast, continuing in this direction to the two-lane pavement on the Wisconsin side. At this end the 50' 9" (15.46 M.) plate girder approach rests on a low concrete abutment. In contrast to the urban-residential character of Rhomberg Avenue as it approaches the bridge from the southwest, the Wisconsin approach passes through a wooded area of sloughs and backwater. Before construction of Lock and Dam No. 11 this area was even more extensive than it is today. Beyond, to the east, is the rolling farmland of Grant County, Wisconsin.

Piers 1 through 4 (counting from weat to east) date from the original 1901-1902 construction. Each consists of a pair of cross-braced steel columns, filled with concrete, that are set on pedestals having concrete cores faced with cut limestone. These pedestals are set on wood pilings, and the "shaft" of each pedestal risea 24' (7.32 M.) above a masonry base. The heights of these bases vary: the base of pedestal No. 1 is 7' (2.13 M.), that of No. 2 is 10' (3.05 M.), and those of Nos. 3 and 4 are 2' (0.61 M.). The columns of piers 1, 2, and 3 are 52' 0-1/2" (15.86 M.) high, while those of No. 4 are 44' 0-1/2" (13.42 M.) high. The flared base of each column is secured to the pedestal by bolts driven vertically into the masonry cap. All of the columns have steel reinforcing bands, the first of which were installed in the mid-1960's. Water running off the superstructure tends to freeze between the steel columns and concrete cores, causing the metal to crack. Efforts to seal the tops of the columns have been only partly successful.

Pier No. 5 was built in 1906, to support the east end of the Baltimore

deck truss span. This pier resembled the earlier piers in its use of twin columns (6' (1.83 M.) in diameter and 31' (9.45 M.) high) set on a 23' (7.01 M.) pedestal. During the 1935-1936 addition of three more spans, this pier was retained, but the columns were reoriented (to carry the west end of the first skewed span) and the entire pier was encased in concrete. Piers 6 (47' (14.33 M.)) and 7 (40.95' (12.482 M.)) consist of twin battered concrete columns on 6' (1.83 M.) platforms resting on wood piling. The columns are connected by a flat "membrane" of concrete that is flared at the top to form a coping for the top of the pier. The nosings are formed by extending the upstream side of the appropriate column in two shallow, intersecting curves. Pier No. 8 (34' (10.36 M.)) is similar to piers 6 and 7, but due to its shore location lacks the upstream nosings required on the river piers. The coping of this pier is stepped, the lower step bearing the end shoes of span No. 8, the upper (approximately 2' higher) carrying the ends of the short approach span's plate girders.

Span No. 1 is an eight-panel pin-connected Pratt through truss 191' 4" (46.13 M.) long. It measures 20' 10" (6.35 M.) high center to center of pins, and 19' 6" (5.94 M.) center to center of the trusses. The top chord and vertical compression members are built up of laced channels, while pairs of slender eyebars are used for diagonal tension members. The bottom chord consists of double eyebars, reinforced with rods (with turnbuckles) between the bars. The deck extending across spans 1 through 5 is a steel mesh grid installed in 1949. It is carried on I-beam floorbeams riveted to the vertical posts above the bottom chord connections, and steel stringers. Other members include top struts consisting of paired ells with a V-lattice, and portals displaying a wide diamond lattice of ells. Centered at the west portal is a nameplate ("Dubuque and Wisconsin Bridge, 1901").

On the upstream inclined end post is a designers' plate ("E. C. and R. M. Shankland"), and on the downstream end post a builders' plate ("Toledo Bridge Co., Linehan and Molo").

Spans 2 and 3 are 20-panel Pennsylvania truss spans, of the "Camelback" variety in which the trusses' polygonal top chords have five slopes. Basically identical, these spans measure 378' 4" (115.32 M.) in length, 50' (15.24 M.) high center to center of pins, and 19' 6" (5.94 M.) wide center to center of trusses. The top and bottom chords, and vertical compression members, are built up of the same elements ss those of span No. 1. The diagonal tension members consist of paired eyebars between rods of square section. Horizontal compression members, which subdivide the larger panels, are laced double channels with the flanges turned inward. The top struts are fashioned from paired ells with X-lacing, while intermediate struts (20' 10" (6.35 M.) above the roadway) consist of V-laced double ells. As on span No. 1, I-beam floor beams carry the steel deck and stringers.

Span No. 4 is a 198' (60.35 M.), 11-panel Pratt through truss. It measures 28' (8.534 M.) high center to center of pins and is 19' 6" (5.94 M.) wide center to center of trusses. Like the first three spans, these trusses utilize laced channels for the top chord and vertical compression members, and double eyebars for bottom chord and diagonal tension members. The portals and top struts are also similar to those of span No. 1. At the east end of span No. 4 (which was the end of the original bridge) are name, designers' and builders' plates identical in wording and placement to those on the west end of span No. 1.

Span No. 5 is a 324' (98.76 M.), pin-connected Baltimore deck truss

fearuring parallel top and bottom chords and 9 panels subdivided into a total of 18. The span maintains the 19' 6" (5.94 M.) width of the earlier sections of the bridge, with a truss depth of 37' 1-1/16" (11.32 M.) center to cenrer of pins. It is popularly known as the "upside down" span and to the general public has been one of the more memorable features of the entire bridge. The west (fixed shoe) end has short vertical end posts which rest atop pier No. 4. At the easr (expansion shoe) end, inclined end posts rest not on top of the pier, but on the pedestal. The impression given by this somewhat unusual construction is thar rhe trusses of the span are inverted at the west end and "right side up" on the other. From rhe top chord-inclined end post connection (U16) of each truss, a member of laced channels extends horizontally ro a vertical post which in turn is connected to rhe bottom chord and base of the inclined end post at the shoe (L18). On the upstream side, a portion of the horizontal extension has been cut away to accommodate the angled configurarion of the roadway as it moves onto the skewed truss to the east. The deck is carried on I-beam floor beams which are riveted to the vertical truss members approximately 4 feet below the level of the top chord. Lateral bracing consists of pairs of laced ells, riveted at midpoint of the vertical members.

Both top chord and vertical compression members of this span are built up of laced channels, an X-lattice used for the former and a V-lacing for the latter. The bottom chord and main diagonal tension members are double eyebars, in both cases reinforced with rods wirh turnbuckles. A builders' plate ("Builr by A. Y. Bayne & Co., Minneapolis, Minnesota, 1907") is located on the inner face of the upstream top chord, near the west end.

Spans 6, 7, and 8 are riveted Pratt through trusses of 8 panels each, their axes skewed 26° 8' 15" from the axes of their piers. Each span is 160'

(48.77 M.) long, 29' (8.84 M.) high center to center. A system of I-beam floor beams and stringers carries a 20' (6.10 M.) roadway. Each truss has a regular hip at one end (for an end panel 11' (3.35 M.) long) and a half-hip at the other (for an end panel 22' (6.71 M.) long). To accommodate the skewed configuration, each pair of end panels consists of one hip and one half-hip, the up- and down-stream sides alternating from span to span. This pattern enables the fixed vertical posts of the trusses to remain in line with one another the full length of each span.

The top chords of these spans are built up of laced channels with cover plates. Vertical compression members are laced channels (without cover plates) and the bottom chord consists of double channels joined at intervals by tie plate segments. Diagonal tension members of the inner four panels of each truss are fashioned of two ells a few inches apart, also joined at intervals by riveted tie plates. The two outermost panels of each truss are of heavier construction, consisting of four ells held together with a continuous plate between them. A builder's plate ("Built by Worden-Allen Co., Milwaukee, Wis.") is located on the upstream inclined end post at the east end of span No. 8.

# HISTORICAL DISCUSSION

## The Historical Context

Dubuque, Iowa is a city of some 50,000 located on the Mississippi River in northeast Iowa. Across the river lies East Dubuque, Illinois, just below the boundary between Jo Daviess County, Illinois, and Grant County, Wisconsin.

This particular area of the Old Northwest is a "hard and rocky land of bluffs and valleys" in which the first white settlement, beginning in the early 1820's, was centered on lead mining.[1] The nature of this economic activity encouraged proliferation of towns in the region, to accommodate swiftly-increasing populations, provide services, merchandise and equipment to miners and the mines, and to ship lead ore down the Mississippi River to manufacturing and processing centers. Invariably, however, a few towns prospered while others failed. Two of the lead region's principal centers proved to be Mineral Point (Wisconsin) and Galena (Illinois), both established in the mid-1820's. The third was Dubuque, Iowa, site of lead mining in the late 18th century under French-Canadian Julien Dubuque. The community bearing his name was settled in 1832-33, coincident with the opening of eastern Iowa to legal white occupation through the Black Hawk Treaty. The geology of the west side of the Mississippi favored the lead mining industry, because lead from the Dubuque area required no smelting, unlike the ore (galena) on the Illinois-Wisconsin side.[2]

Lead proved to be an exhaustible resource, however, and in the late 1840's, as the mines played out, populations on both sides of the river began a gradual reorientation toward an agricultural economy. Agricultural

settlement had come to the area with the miners, hopeful farmers encouraged by the high price of foodstuffs of all kinds in the mining towns. But the transition to cash crops was made easily, as proximity to the Mississippi allowed shipment of produce on a large scale to urban markets, and was further encouraged by decline of the mines. By the Civil War, the economy of the one-time lead region was firmly oriented toward agriculture, which demand and accompanying rise in prices during the war only served to enhance.[3]

Of the former lead region's three principal cities, Dubuque made the most successful transition to other economic activities, primarily due to its location on the Mississippi (neither Mineral Hill nor Galena were so sited). During the 1850's, Dubuque developed as a significant agricultural service center and transportation node in northeast Iowa, bringing in manufactured goods and shipping out agricultural products on steamboats that plied the current from St. Paul to St. Louis and New Orleans. Toward the end of this decade, the city began the transition to railroads as the principal means of transportation, with a concomitant reorientation of its interests east to Chicago and west to the rapidly developing agricultural areas of the prairies and plains. Following the Civil War, meat packing, brewing and wagon manufacturing concerns brought an additional industrial element to Dubuque. In the 1870's and 1880's the local economy was further boosted by development of large-scale lumber milling and wood working industries, both dependent on logs floated downriver from pine forests in Minnesota and Wisconsin.[4]

Despite the early importance of the Mississippi River to midwestern commerce and transportation, the river also stood as an obstacle to efficient east-west travel. By 1840, Jordan's Ferry was well established

opposite Dubuque, offering not only transportation across the river but also a tavern, stable and grocery for patrons' convenience.[5] Although in winter the crossing was "free", as the river froze solid for several months and people simply walked or drove their wagons across the ice, warm weather brought strong demand for ferry services. Complaints of unreasonable charges--one dollar in 1848--prompted calls for the city to provide free ferry service, or at the very least to limit the amount operators could charge.[6]

That year, the "exclusive" ferry charter was held by one Timothy Fanning, who landed between 2nd and 4th Streets. Although the city did not, in the end, develop a free ferry, it did award at least one other ferry charter to promote competition and thus lower rates. In 1851 S. L. Gregoire obtained city authorization to establish a steam ferry (the crossing having heretofore been accomplished by flatboats or skiffs), which was permitted to land between 4th and 5th Streets.[7]

## Early Bridges at Dubuque

Although the first bridge over the Mississippi was erected in 1856, between Rock Island and Davenport, Iowa, more than a decade passed before other Iowa river cities were similarly blessed. Construction of a multi-span bridge was a large undertaking, requiring Congressional approval (because as two states and a major river were involved, it was a matter of interstate commerce), a high level of engineering ability, a great deal of money, and a likelihood that traffic over the structure would bring sufficient revenue through fees and tolls to pay off the initial investment. As a result, bridge building over the Mississippi to Iowa awaited the

interest (and finances) of railroads, which following the Civil War began to extend their lines from Chicago to the plains of the west. The 1860's saw construction of railroad bridges to Clinton (1864), Burlington (1868) and Keokuk (1869-71), and later replacement of the span at Davenport (1872). These spans were funded by railroad companies, often assisted by contributions in the form of stock subscriptions purchased by businessmen and other residents of the recipient communities. Only the Chicago, Rock Island & Pacific Railroad bridge to Davenport received federal aid, due to its location between the Iowa shore and the U.S. Army's arsenal on Rock Island.[8]

In Dubuque, the Dubuque-Dunleith Bridge Co. was organized in 1867 to build a bridge between these two communities for the Illinois Central Railroad. Bids were solicited in January 1868, and the iron bridge carried its first rail traffic in December of that year. It was a single-track double intersection through truss structure elevated on large limestone piers, with a 360' swing span and six fixed spans. Reynolds, Saulpaugh & Co. of Rock Island built the substructure, the contract for erection of the superstructure going to the Keystone Bridge Co. of Pittsburgh.[9]

Unlike the Keokuk and Davenport spans which served both rail and vehicular traffic, the Dubuque-Dunleith bridge provided no lanes for wagon or pedestrian traffic.[10] In response to increasing impatience with area ferry service, the Dubuque Manufacturers' Association in 1874 sent a representative east to find out how a wagon bridge might be locally funded.[11] Nothing appears to have resulted from this venture, however.

Finally, in August 1886, Horace E. Horton of Rochester, Minnesota, was awarded a contract to build a "high bridge" for vehicular traffic between Dubuque and East Dubuque (formerly Dunleith, Illinois), which would be

owned and operated by the Dubuque High Bridge Co. It was to be funded through tolls until construction costs were paid off, at which time it would be taken over by the city of Dubuque. Iron for the bridge, the first highway crossing erected over the Mississippi below St. Paul, arrived in March 1887, and four spans were up by July. The bridge, which featured a 363-foot cantilever channel span, was opened with due ceremony on 29 December 1887, although the first wagons had crossed four days earlier.[12]

The Dubuque and Wisconsin Bridge

The High Bridge was located only a short distance upstream from the Dubuque-Dunleith railroad bridge, and thus primarily served Illinois and downtown Dubuque interests. Dubuque, however, was hemmed in by bluffs on the south and west, discouraging if not preventing urban expansion in those directions. As a result, late 19th century growth was to an extent channeled north, through Couler Valley and northeast along Rhomberg Avenue toward the towering limestone bluff of Eagle Point. Across from Eagle Point lay Grant County, Wisconsin, an agricultural area of small towns and hamlets whose farmers, although desiring to bring their crops to Dubuque for shipment to market, were frustrated by rough roads and inconveniently long distances. A road along the east bank of the Mississippi had once provided a reasonable route to East Dubuque and the High Bridge, but it was taken over by the Burlington Railroad. Grant County farmers were thus forced to detour "around the hills," and the additional few miles proved "too great on short days to permit them [to reach Dubuque via the High Bridge] and get home before dark."[13]

The notion of a bridge to Wisconsin from Eagle Point surfaced in the

1880's, even as the High Bridge was under construction. Early in the decade, a charter was granted to a "Dubuque and Wisconsin corporation" to build a bridge at the Point. Then in 1886, the Wisconsin, Illinois and Iowa Bridge Co. was incorporated to build a railroad bridge for the Burlington line at the same place, and plans were made to develop a townsite on the Wisconsin shore. However, neither of these ventures proved successful, and no bridge rose off Eagle Point.[14]

Prospects for a crossing at Eagle Point remained poor until 1894. On May 29 of that year, Joseph A. Rhomberg of Dubuque brought "the movement...to a head" by leading the organization of the Dubuque and Wisconsin Bridge Company. The articles of incorporation included over 400 signatures from Grant County, Wisconsin and from residents and businessmen in Dubuque's north end.[15] Rhomberg's interest in the project was understandable, as his entire career had been concerned with rail transportation. The patriarch of an influential local family, Joseph Rhomberg was born in Austria in 1833, and emigrated to Dubuque (along with many others from German states) in 1854. His major accomplishments included development of the Chicago, Dubuque & Minnesota Railroad, the Chicago, Clinton & Dubuque Railroad, and part of the Austin & Northwestern line in Texas. Not least of Rhomberg's interests was the Dubuque Street Railway, of which he was a founder and former owner. Rhomberg's involvement in plans for a bridge at Eagle Point reflected this interest. The proposed span was to be built strong enough to carry streetcars, should a Wisconsin line be developed which a Dubuque-based line might join.[16]

In 1894, however, Dubuque, like much of the rest of the nation, still felt the impact of the previous year's financial panic, and sale of bridge company stock at $100 per share proved difficult. The project may also

have been sidetracked by the issue of a city-built free bridge, which was raised by the Dubuque Daily Herald in February 1895. This alarmed owners of the Dubuque High Bridge Company, who offered to transfer their span to the city under more favorable terms than had been included in the 1886 ordinance authorizing its construction.[17] When the offer failed to interest the city council, the Dubuque High Bridge Co. reminded council members that the ordinance had also prohibited the city from funding "directly or indirectly" another bridge until the cost of the High Bridge was realized and the structure turned over to public ownership.[18] Nonetheless, the Dubuque city council voted to give $25,000 to the Dubuque and Wisconsin Bridge Co., contingent on that company's raising the full amount needed to construct a new bridge.[19]

A promise of city assistance was apparently not enough to generate private help in the form of stock subscriptions. Enthusiasm for a Dubuque-Wisconsin crossing waned, and the officers of the bridge company did not meet again for over three years. In February 1899 however, they seemed ready to try once again, although Joseph A. Rhomberg had died two years before.[20] An article in the Dubuque Daily Herald noted that Grant County farmers, at least, remained "enthusiastic" about the possibility of a bridge at Eagle Point, and indeed, three of the twelve directors were from Wisconsin. The article also reported that the company had devised plans for a bridge that would cost significantly less than earlier estimates had indicated.[21]

The major problem was once again the need to raise money to finance construction. In August, 1899, the company opened its csmpaign with the announcement that Grant County farmers had already pledged $15,000 in

subscriptions--this before any fund-raising efforts had begun in Dubuque. To assure prospective investors that the company was serious about the project, Chicago architect-engineer Edward Clapp Shankland was brought in to conduct location surveys at Eagle Point, for a 1460-foot main span with a 900-foot Iowa approsch and a 1800-foot Wisconsin approach.[22]

On 1 October 1899, the Dubuque and Wisconsin Bridge Co. mounted an intensive stock canvass, beginning in the city's Fifth Ward. By the end of that month, over $50,000 had been raised, and extension of the canvass in subsequent months brought in an additional $44,000. Over 300 persons ultimately subscribed to Dubuque and Wisconsin Bridge Company stock. However, despite the city-wide campaign, most of the subscribers came from Grant County and from the Fifth and Third Wards, both located in Dubuque's north end, and included "nearly every merchant and businessman in the upper part of the city."[23]

In esrly February 1900, the Dubuque and Wisconsin Bridge Co. received Congressional authorization to span the Mississippi at Eagle Point.[24] With construction funds and Federal permission in hand, the bridge company was at last ready to proceed. E. C. Shankland, confirmed as the designer, conducted test borings into the river bed to determine the exact locations for the piers.[25] Shankland also received advice from the U. S. Army Engineers on the arrangement of the proposed spans in relation to the main channel, the purpose being to obstruct navigation as little as possible.[26]

Although there were rumors that the first contracts would be let in late August 1900, nearly one year passed before work on the four-span bridge began.[27] Early in July 1901, Linehan & Molo, the Dubuque firm selected to build the substructure, began to "bring up" materials in preparation for driving piles for the piers.[28] Under the supervision of

"Mr. Patterson," Linehan & Molo crews completed the pile driving toward the end of August. There was some trouble in locating the first pier on the Iowa side, as the rock ledge on which it was to rest was found to be uneven and cut by a crevice which had to be filled with concrete before work could proceed. Piles for the remaining three piers were driven without problem, cut off about 2' above the river bed, and capped with 12" oak timbers. Crews then built wood plank cofferdams around the piling. Once the cofferdams were unwatered, workmen erected cut limestone "shells" into which concrete was poured to form the pedestals.[29]

The long trestle of the Wisconsin approach was begun about the same time as the river piers. By the end of October 1901, it "loom[ed] in plain sight" from the Iowa shore.[30] Work on the Iowa approach, however, was delayed until mid-November. This approach was to be built by the City of Dubuque, which had exercised its power of eminent domain to obtain the necessary right of way at the north end of Rhomberg Avenue. A portion of the right of way was to pass through land in the George Fengler estate, and the Fengler heirs contested (somewhat ironically, as Fengler had been an early bridge proponent and officer of the bridge company) the condemnation order for a time.[31]

Having settled the Fengler matter, the city started work on the Iowa approach under the direction of city engineer M. Tschirgi. Ground was broken on 13 November, and the arduous task of blasting a road out of Eagle Point's limestone flank began.[32] At the same time, Linehan & Molo crews put finishing touches on the concrete-filled limestone pedestals of the river piers, and prepared to erect the hollow steel columns, each 8' in diameter, which would also be filled with concrete.[33]

Although not quite on schedule--the piers were to have been completed by 1 November--progress was such that as winter set in crews from the Toledo Bridge Co. (recently consolidated with a number of other bridge firms into the American Bridge Co.) were able to begin preparation for erecting the steel superstructure. The extreme cold weather of this winter of 1901-1902 was to work both for and against the project. Supervising engineer R. C. Smith of the Toledo Bridge Co. planned to erect falsework on the solidly-frozen river, but the same chill that produced two feet of ice by February was also a harsh--and dangerous--environment in which to work. Erection of falsework was shut down at least once due to the cold, in mid-December, and the death of carpenter Frank J. Cheney in February was attributed to his slipping on a frost-covered plank.[34] There were other accidents as well: four men were injured in late November when scaffolding on the Wisconsin approach failed. Then just before Christmas, "Mr. Wickberg," an iron worker with the Toledo Bridge Co., was killed when he fell from the top of a pier to the stone riprap below. Another fatality occurred in early January 1902, when crewman Frank Hart was caught in the rope of one of the three hoisting machines then being used to construct the falsework.[35]

In spite of these tragedies, construction of the Dubuque and Wisconsin Bridge moved steadily toward completion. On 18 February 1902, the Dubuque Daily Times reported that the west abutment and approach, and also the trestlework of the long Wisconsin approach, were finished. Erection of the steel superstructure was begun at this time, starting with the first of the two Pennsylvania truss spans.[36] By the end of March all four truss spans were in place, the westernmost (Pratt) going up last. With completion of the bridge imminent, an enterprising soul began to construct a "new frame

building" near the end of the Wisconsin approach--which proved to be a saloon. At the aame time, in wilful denial of reality, local ferry owner "Capt. Kimball" announced that he would "continue to run his ferryboat, just the same as if there were no bridge."[37]

During late March and April, construction crews labored through the final phaaes of the work, laying the planking of the bridge and Wisconsin approach roadways, and also a sidewalk along the east side of the Iowa approach. With warm weather, the project became a source of local entertainment, "huge crowds" coming to Eagle Point on Sunday afternoons to look at the bridge.[38]

At the end of April, it was announced that pedestrians and wagon teams would be able to use the bridge by the first week in May, but to the "surprise and regret" of many, the Dubuque and Wisconsin Bridge Co. planned no celebration to commemorate the bridge opening. The final cost of construction proved to be about $110,000, not including the $25,000 donated by the City of Dubuque for the west approach, and bridge company officials decided that a celebration would aimply be too expensive. The Dubuque Retailers' Asaociation canceled plans for an "event" at the last minute; but the Dubuque Saengerbund Society (a German social and cultural organization) offered to mount some aort of celebration in mid-May. They were enthusiastically joined by "many farmers and citizens of the other side of the river" who marked their new access to Dubuque with a "procession and parade" acroaa the bridge and into the city.[39]

The completed Dubuque and Wisconsin Bridge (which was locally known even during construction as Eagle Point Bridge) consisted of four pin-connected through truas spans: two Pennsylvania truss (Camelback

version) spans over the navigation channel flanked at each end by Pratt truss spans. The Iowa approach, cut out of Eagle Point's limestone mass, was over 1000 feet long. The 1950-foot east approach was a planked trestle roadway on wood pile bents, winding in a long curve through the hummocks and backwaters separating the Mississippi's main channel from the solid ground of the Wisconsin shore.[40] This approach soon proved to be the weakest "link" in the crossing: less than three weeks after the bridge opened on May 4, high water took out 200 feet of trestlework and shoved some 300 feet more out of alignment.[41] In addition, it was found necessary in subsequent months to close the bridge at "nearly every rise" of the river, due to flooding of portions of the east approach. In November and December 1903, sections of the approach were raised, on rock filling taken from bluffs on both sides of the river.[42]

Even with improvements such as this, however, Eagle Point Bridge continued to have difficulties with the river it was intended to cross. On 5 November 1906, the Duqubue and Wisconsin Bridge Co. announced plans for an additional steel span at the east end of the existing trusses. This 324-foot pin-connected Baltimore deck truss would replace at least some of the troublesome trestle, and by freeing the bridge from problems due to floods and ice chokes, facilitate the "Wisconsin trade" so ardently sought by the structure's owners and backers.[43]

The bridge company's contract with A. Y. Bayne of Minneapolis called for construction of the 324-foot span and one pier, the work to be completed by 25 March 1907. The pier, apparently similar to those erected in 1901, was finished in December 1906, and ten carloads of steel from Minneapolis Steel & Machinery arrived in mid-January of the following year. Under the supervision of R. H. McLean, the new span was erected in about 45 days,

opening on 30 March 1907.[44]

Addition of a fifth span did not, in the end, eliminate all the problems associated with the Wisconsin approach. In the summer of 1918, the La Crosse Dredging Co. moved 50,000 cubic yards of sand from the river to the east end of the Wisconsin approach, creating an embankment 25 feet above the usual water level, designed to prevent flooding at that point. The approach itself required "yearly planking and strengthening" which put a constant drain on the bridge company's ever-slender financial resources.[45] Finally, in 1922, the Minneapolis Bridge Co. was retained to replace the wooden bents with 25 three-pile steel bents on concrete pedestals. The alignment of the approach was also altered, to eliminate a "bad curve" of some 600 feet. This effort was completed in early autumn 1922, without interruption of traffic.[46]

Substitution of steel for the original wood pile trestle bents appears to have ameliorated most of the problems associated with the Wisconsin approach. In the 1930's however, the nine-foot channel program of the U.S. Army Corps of Engineers resulted in yet another phase of construction at Eagle Point Bridge. Lock and Dam No. 11 were built about 1000 feet upstream from the bridge. The dam, approximately 300 yards long, extended well beyond the east end of the bridge. Army engineers anticipated significant changes in the water level along the Wisconsin side that would once again render the east approach subject to flooding.

To solve this problem, the Corps decided to add still more spans to the Dubuque and Wisconsin Bridge. Most of the possible alternatives involved extending the bridge along its existing axis (perpendicular to the main channel current) and building a new roadway approach with a long curve to

the south to connect with the existing roadway well beyond the area subject to flooding. The plan ultimately adopted, however, eliminated the length and curve of a new road by erecting three skewed spans that essentially followed the alignment of the 1922 steel trestle about 545 feet to the roadway.[47]

Bids for the work were opened at Rock Island, Illinois on 30 August 1935. The successful low bidder was the Worden-Allen Co. of Milwaukee, Wisconsin, which began work on 30 September. A line of oak piles was set about 40 feet north of the existing approach, and the trestle was moved over steel rollers along two I-beams to rest on the new piles, thus providing a roadway for traffic while construction of the new steel spans was in progress.[48]

Three new concrete piers were erected during the work. In addition, the pier built in 1906 to carry the east end of the deck truss span was completely encased in concrete, allowing a slight realignment toward the top necessary for this pier to carry the first of the skewed spans.[49] This alteration did not affect the existing deck truss, because the latter's end shoe rested not on top of the columns but on the pedestal below.

Most of the pier work was accomplished in the early months of 1936. Erection of the riveted steel superstructure was begun on 6 May, and was completed by early June. During the summer, the concrete floor slabs were poured, the old approach dismantled, and an area some 160' wide and 700' long dredged out beneath the structure. Worden-Allen Co's work, hampered at various times by labor shortages and an apparent lack of "effective methods" and "adequate equipment," was completed in mid-August 1936, and accepted by the Federal government on August 21.[50]

With addition of these three spans, Eagle Point Bridge at last

achieved a complete channel crossing no longer susceptible to flooding at the eastern end. The last major improvement was made in 1946-47, when an open grid steel floor replaced the creosoted wood roadway on the first five spans. About 20 years later, inspection revealed cracks in several of the steel pier columns, caused by water freezing and expanding between the concrete core and the metal casing. From 1965 on, reinforcing bands were added to each column as cracks appeared. This may have led to removal of highway designation in 1968 and imposition of a four-ton load limit which is still in force.[51]

In 1975, two new toll booths were erected on the Iowa approach. In 1979, the State of Iowa acquired Eagle Point Bridge from the Dubuque and Wisconsin Bridge Company and soon thereafter began construction of City Island Bridge about one-half mile to the south. Eagle Point Bridge will be removed once the new tied-arch steel span is open to traffic in 1982.

## Contextual Analysis

The first bridge over the Mississippi River below the Falls of St. Anthony (Minneapolis) was erected in 1853-1856 between Rock Island, Illinois and Davenport, Iowa. For nearly a decade it remained Iowa's only Mississippi River crossing. In the years immediately following the Civil War, several more bridges were built between Iowa and Illinois, among them the Chicago & Northwestern Railroad bridge at Clinton (1864), the Chicago, Burlington & Quincy Railroad bridge at Burlington (1868), the Keokuk-Hamilton Bridge (1871), and the Illinois Central Railroad bridge at Dubuque (1868). The 1880's saw construction of still more bridges: the Chicago, Milwaukee & St. Paul Railroad bridge at Savannah, Illinois (1881),

the Santa Fe Railroad bridge at Fort Madison (1887-88), and the Iowa Central Railroad bridge at Keithsburg, Illinois (1886).

As their names indicate, all these bridges were built for rail traffic, although several, such as the Davenport, Fort Madison and Keokuk spans carried wagons and pedestrians as well. Although the first Mississippi River bridge built exclusively for non-rail traffic was erected at Minneapolis, Minnesota in 1855, no others of this type were built until construction of the high bridge at Dubuque in 1887. Within the next four years, three more highway spans were built to Iowa cities: the Lyons-Fulton (1891), Clinton (1892) and Muscatine (1891) high bridges. They were followed in 1901-1902 by Eagle Point Bridge, now the only one of the first five still standing. Eagle Point was also the last highway bridge built to Iowa until 1917.

Unlike the railroad bridges, which were relatively low above the water and thus included swing or lift spans to allow passage of river traffic, Iowa's early (and indeed all later) highway bridges were built well above the stream, often with at least one inclined approach. Of the first five highway bridges to Iowa, three (Dubuque, Clinton and Muscatine) featured the then relatively new cantilever truss. The Lyons and Eagle Point bridge employed the more traditional Pratt and Pennsylvania truss types, the former ubiquitous in the state, the latter particularly suitable for long navigation-channel spans.

In this context, the design of Eagle Point Bridge can be seen as relatively conservative. The features which distinguish it today were not part of the original four-span construction, but were the result of subsequent efforts to deal with the structure's major shortcoming--a long curved trestle approach on the east end that was perpetually subject to

flood damage.

The first effort was the 1906-1907 replacement of several hundred feet of trestle with a fifth span, a deck truss similar to those often employed on approaches of both railroad and highway bridges. In 1922, when the original wood pile bents of the remaining wooden trestle were replaced with more durable steel, the east approach was slightly realigned, but a curve from the bridge to the Wisconsin road remained. When three more spans were added to the east end in 1935-36, the Corps of Engineers met the issue of the curve by skewing these spans to the northeast, which eliminated the trestle approach but not, really, the curve.

The Corps' work thus produced two features for which Eagle Point Bridge is best remembered in the public mind. One is the angle in the roadway above the river, the other is the seemingly odd placement of the deck truss span. The first is a legacy of the original design, in which the bridge was built at right angles to the main channel current, rather than skewed for its whole length in a direct line to the Wisconsin road it joined. Engineer Edward Shankland probably had little choice in this matter: a skewed configuration permitted less horizontal clearance between navigation channel piers than did an orientation perpendicular to the current. (Although a skewed plan was employed at Keokuk, it was controversial, and may have succeeded only because river traffic had to pass through the Des Moines Rapids canal and lock system anyway.) Since the road on the Wisconsin side apparently could not be relocated, inclusion of a curve somewhere on the bridge was inevitable. In this regard, the Corps accepted existing conditions, simply substituting skewed trusses for the curved approach. These were again Pratt trusses (although riveted,

rather than pin-connected as were the earlier spans), and as such confirm, if nothing else, the enduring utility of that truss type. They are not without interest, however; the alternative hip and half-hip configurations of the end panels illustrate a straightforward engineering solution to the problem of placing trusses on a skew with the piers, which of necessity must be oriented with long axes parallel to the river current.

The use of a deck truss at the eastern end of Eagle Point Bridge was at the time neither unusual nor noteworthy, nor particularly striking when it was connected to a trestle approach. It only became so with the Corps' decision to use through trusses for the last three spans. With their construction, the deck span achieved a visual distinction because its "hanging" trusses contrasted so sharply with the "upright" through trusses at either end.

Although Baltimore trusses were probably not uncommon features of late 19th and early 20th century bridge building in Iowa, the Baltimore truss at Eagle Point is now one of the few of its type so far recorded in the Iowa Department of Transportation's ongoing inventory of truss bridges in the state, and so far the only known example of this truss type used in a deck configuration. In addition to its contrast with the other spans at Eagle Point, this truss exhibits an interesting internal contrast, between the west end, with its extremely short vertical end posts resting on the tops of the pier columns, and the east end, where full-length inclined end posts are set on the pedestal cap. Finally, it is possible to read this truss as a version of the rare "half-deck" type, distinguished by placement of the deck several feet below the level of the top chord.

FOOTNOTES

[1]Malcolm J. Rohrbough, The Trans-Appalachian Frontier (New York: Oxford University Press, 1978), pp. 335-336.

[2]Ibid., pp. 336-337; Franklin T. Oldt, ed., History of Dubuque County, Iowa (Chicago: Goodspeed Historical Association, 1911), p. 47.

[3]Rohrbough, The Trans-Appalachian Frontier, p. 337; John E. Brush, The Trade Centers of Wisconsin: An Analysis of Function and Location (Madison, 1952), p. 166; Joseph Shafer, The Wisconsin Lead Region(Madison: State Historical Society of Wisconsin, 1932), pp.132, 162.

[4]Lawrence J. Sommer, The Heritage of Dubuque(Dubuque: First National Bank, 1975), pp. 5-6.

[5]Oldt History of Dubuque County, p. 66.

[6]Ibid., p. 83.

[7]Ibid., pp. 83-84, 92, 94.

[8]See Dennett, Muessig & Associates, Ltd., "Bridges over the Mississippi and Missouri Rivers to Iowa," Iowa City, 1982. (Typewritten.)

[9]C. Childs, History of Dubuque County, Iowa (Chicago: Western Historical Association, 1880), pp. 637-639; Oldt History of Dubuque County, p. 160. Spans of the Dubuque-Dunleith Bridge were replaced between 1893 and 1903.

[10]Childs History of Dubuque County, p. 637; Oldt History of Dubuque County, p. 174.

[11]Oldt History of Dubuque County, p. 174.

[12]Ibid., pp. 188-190. The Julien Dubuque bridge, another cantilever span, replaced the High Bridge in 1943.

[13]Dubuque Enterprise, 27 April 1904, p. 4; Dubuque Telegraph-Herald, 16 December 1901, p. 8.

[14]Dubuque Daily Herald, 20 March 1886, p. 2.

[15]Ibid., 30 May 1894, p. 4.

[16]Oldt History of Dubuque County, pp. 532-533.

[17]Dubuque Daily Herald, 3 February 1893, pp. 4, 8.

[18]Ibid., 17 August 1895, p. 8.

[19]Ibid., 5 November 1895, p. 8.

[20]Dubuque Trade Journal, May 1897, p. 4.

[21]Dubuque Daily Herald, 20 February 1899, p. 8.

[22]Ibid., 11 August 1899, p. 8.

[23]Dubuque Enterprise, 27 April 1902, pp. 1, 3; Dubuque Daily Herald, 1 October 1899, p. 8; 15 October 1899, p. 8; 18 January 1900, p. 8.

[24]Ibid., 6 February 1900, p. 8.

[25]Ibid., 6 February 1900, p. 5.

[26]Ibid., 13 May 1900, p. 3.

[27]Ibid., 29 July 1900, p. 6.

[28]Dubuque Daily Telegraph, 3 July 1901, p. 1.

[29]Dubuque Daily Times, 24 August 1901, p. 5; Dubuque Telegraph-Herald, 4 May 1902, p. 1.

[30]Dubuque Daily Telegraph, 30 October 1901, p. 3.

[31]Dubuque Daily Herald, 17 August 1895, p. 8; Dubuque Daily Telegraph, 30 October 1901, p. 3; 31 October 1901, p. 10.

[32]Dubuque Daily Times, 12 November 1901, p. 6; 13 November 1901, p. 6; 28 November 1901, p. 4.

[33]Ibid., 12 November 1901, p. 6; Dubuque Globe-Journal, 6 October 1901, p. 9.

[34]Dubuque Globe Journal, 6 October 1901, p. 9; Dubuque Enterprise, 27 April 1902, p. 2; Dubuque Daily Times, 15 December 1901, p. 5; 6 February 1902, p. 5.

[35]Dubuque Daily Times, 21 November 1901, p. 2; 24 December 1901, p. 6; 7 January 1902, p. 7.

[36]Ibid., 18 February 1902, p. 5.

[37]Ibid., 25 March 1903, p. 3.

[38]Ibid., 25 March 1903, p. 3.

[39]Dubuque Telegraph-Herald, 4 May 1902, p. 1; Dubuque Trade Journal, May 1902, p. 4.

[40]Dubuque Daily Times, 25 March 1902, p. 3.

[41]Dubuque Telegraph-Herald, 24 May 1902, p. 3

[42]Ibid., 9 December 1903, p. 6.

[43]Ibid., 5 November 1906, p. 2.

[44]Dubuque-Times Journal, 18 January 1907, p. 5; 1 April 1907, p. 1.

[45]Dubuque Telegraph-Herald, 22 July 1918, section 2, p. 1.

[46]Dubuque Times-Journal, 15 September 1922, p. 12. The Minneapolis Bridge Co, was incorporated 1 January 1917 (Clement Kachelmyer, Minnesota Department of Transportation, personal communication).

[47]See "Mississippi River Lock and Dam No. 11, Eagle Point Bridge, U. S. Highway No. 61, Study No. 1, February, 1934," in the engineering files of the U. S. Army Corps of Engineers, Clock Tower Building, Rock Island, Illinois, Sheet M-L11, 7A/1.

[48]"Final Cost Report, Bridge Alterations, Dubuque, Iowa," February, 1937, U.S. Army Corps of Engineers, Rock Island, Illinois. (Mimeograph.), pp. 1, 4.

[49]See "Mississippi River Lock and Dam No. 11, Eagle Point Bridge, Masonry--Piers No. 1 & 4," Sheet M-L11 60/3, in files of Modjeski & Masters, Consulting Engineers, Mechanicsburg, Pennsylvania.

[50]"Final Cost Report," pp. 4-9 passim.

[51]Inspection Files, Eagle Point Bridge, Iowa Department of Transportation, Ames, Iowa.

BIOGRAPHICAL: EDWARD CLAPP SHANKLAND

Edward Clapp Shankland was born in Pittsburgh, Pennsylvania in 1854. The following year his family moved to Dubuque, Iowa, and established a small farm north of the city. After attending Iowa State University and Cornell College (Mount Vernon, Iowa), Edward Shankland studied civil engineering at Rensselaer Polytechnic Institute, from which he was graduated in 1878.[1] From 1878 to 1883, Shankland was with the U. S. Army Corps of Engineers, working on improvements along the Mississippi and Missouri rivers. In 1883 he joined the Wrought Iron Bridge Co. of Canton, Ohio, designing "buildings and bridges."[2]

Perhaps the high point of Shankland's career came with his move to Chicago in 1889. Entering the prestigious architectural firm of Daniel H. Burnham and John Wellborn Root, Shankland was made engineer of construction and chief engineer of works for the World's Columbian Exposition of 1893. Among other efforts, Shankland participated in the design of the Manufactures and Liberal Arts pavilion.[3] At the close of the Exposition in the autumn of 1893, Burnham reorganized his firm as D. H. Burnham & Co. Shankland was invited to become a partner, and for the next few years "supervised the designs, the specifications and the execution of constructive work" for the firm.[4]

Shankland withdrew from the partnership with Burnham in January 1900, some two years after receiving a Telford Medal from the (British) Institute of Civil Engineers "for his work on steel skeleton construction."[5] Sometime between 1898 and 1900 (accounts vary), Shankland established a partnership with his brother, the new firm of E. C. and R. M. Shankland

with offices in Chicago's landmark Rookery Building. One of their early commissions was the Dubuque and Wisconsin Bridge. Shankland remained in this partnership until his death on 3 June 1924.[6]

FOOTNOTES

[1]Dubuque Daily Herald, 6 February 1900, p. 5; National Cyclopedia of American Biography (Ann Arbor: University Microfilms, 1967. Reprint of 1892 edition), 13: 403.

[2]Dubuque Daily Herald, 6 February 1900, p. 5; New York Times, 5 June 1924, p. 21.

[3]National Cyclopaedia 13:403; New York Times, 5 June 1924, p. 21.

[4]Charles Moore, Daniel H. Burnham (New York: Houghton Mifflin Co., 1921), pp. 82-83.

[5]Ibid., p. 83; The Engineer, 1 October 1897, p. 33.

[6]Moore, Daniel H. Burnham, p. 83; New York Times, 5 June 1924, p. 21.

DUBUQUE AND WISCONSIN BRIDGE
Drawing Inventory

I. Drawings included in the Dubuque and Wisconsin Bridge Company Papers, Wahlert Library, Loras College, Dubuque, Iowa. These all appear to be construction blueprints, rather than original drawings. (Note: this collection has not been catalogued as of July, 1982, and the materials contained therein are not available for research purposes.)

A. "Contract No. 2078-82, Mississippi River Bridge at Eagle Point - Dubuque, Iowa, for Dubuque & Wisconsin Bridge Co. ... built by the Toledo Bridge Co., Toledo, Ohio." (This consists of 20 sheets of construction blueprints for the first four spans (erected 1901-1902) and associated piers.)

1. Erection diagram for pier cylinders, 3/8" = 1'
2. Pier cylinders, 1/8" and 3/4" = 1'
3. Sway bracing (piers), 1" = 1'
4. Bracing for pier cylinders, 1" and 1/2" = 12"
5. Erection diagram for 151' 4" span, 3/8" = 1'
6. Details for 151' 4" span, 1" = 1'
7. Portal, struts, floorbeams, shoes, etc. for 151' 4" span
8. Erection diagram for 378' 4" span, no scale
9. Details, end posts and top chord for 378' 4" span, 1" = 1'
10. Posts and bracing for 378' 4" span, 1" = 1'
11. (same as 10)
12. Bottom laterals for 378' 4" span, 1" = 12"
13. Portals and top struts for 378' 4" span, 1" = 1'
14. Beams, for 378' 4" span, 1" = 12"
15. Castings, shoes, etc., for 378' 4" span
16. Erection diagram, 198' span, 3/8" = 1'
17. Panels of truss, 198' span, 1" = 12"
18. Center panel of truss, 198' span, 1" = 12"
19. Floorbeams, shoes and castings, 198' span, 1" = 12"
20. Portals and struts, 198' span, no scale

B. "Design of 492' approach trestle ... submitted by Minneapolis Bridge Co., designed by American Bridge Co., copyright 1921, American Bridge Co."

1. One sheet, no scale, showing elevation, plan of bents, plan of roadway, sections, details (blueprint).

C. Set of 33 sheets of construction blueprints for the skewed Pratt trusses erected at the east end of the bridge by Worden-Allen Co., Milwaukee, Wisconsin, for the U.S. Army Corps of Engineers in 1935-1936. Blueprints are "fogged", but readable. See below.

D. "Highway Bridge over the Mississippi River at Eagle Point ... E. C. and R. M. Shankland."

1. One large sheet containing partial elevation, plans of connections, connection details, elevation details for the Pennsylvania truss spans. Scale 1" = 1'. No date.

E. "Details for 324' 0" span ... for A. Y. Bayne & Co., Minneapolis, from Minneapolis Steel & Machinery Co., Minneapolis."

1. Eight sheets, of various dates in November and December, 1906, which include erection plan, plan of shoes, connections, struts, floor beams, etc. No scale. (See below.)

II. Drawings in the possession of the U.S. Army Corps of Engineers, Clock Tower Building, Rock Island, Illinois.

A. "Dubuque & Wisconsin Bridge, Minneapolis Bridge Co., Minneapolis." Catalogue No. 11U4-2. Blueprints, no scale, not very readable. Appear to be duplicates, except for sheet 1, of set at Loras College, Dubuque

1. Erection plan for 492' steel approach trestle
2. Plan of shoes for 324' span, flr A. Y. Bayne & Co., 11-20-06
5. Details, 324' span, 12-19-06
6. Struts and floorbeams, 324' span, 01-15-07.
7. Details of struts, etc. 01-07-07
8. Details of top chord, 12-27-06
9. Detail of east end post, n.d.
10. Erection plan, n.d.

B. "Eagle Point Bridge, Old Trestle." Catalog No. 11U4-16.

1. Set of blueprints for trestle bents. No scale, no date, no other descriptive information. Appear to be construction blueprints for the 1922 replacement of the wood trestle bents with steel bents. Sheets numbered 37 through 45 from this set are filed with A above (Cat. No. 11U4-2).

C. "Mississippi River Lock and Dam No. 11, Eagle Point Bridge, Study of Connection Detail at Intersection", pencil drawing dated May 28, 1936, initialled by E. C. J., Catalogue No. M-L11 7B/3. This drawing shows the east end of the Baltimore deck truss (Span 5).

D. "Mississippi River Lock and Dam No. 11, Eagle Point Bridge, Temporary Trestle, U.S. Engineer Office, Rock Island, Illinois." Pencil drawing dated August 1935, Catalogue No. M-L11 9/1.

III. Drawings at Modjeski & Masters, Consulting Engineers, Mechanicsburg, Pennsylvania. These are photographic prints of drawing sheets prepared by the U.S. Army Corps of Engineers for the three skewed Pratt truss spans and the plate girder span added to the bridge in 1935-36. The general title for these drawings is "Mississippi River Lock and Dam No. 11, Eagle Point Bridge."

1. Project Location (M-L11 10/4)
2. Site Map (M-L11 10/14)
3. Borings (M-L11 10/15)
4. Hydraulic Data (M-L11 14/1)
5. Stree & Loading Diagrams (M-L11 60/A)
6. General Plan--New Bridge (M-L11 60/1)
7. General Plan--Existing Bridge (M-L11 60/2)
8. General Plan--Existing Bridge (M-L11 60/21)
9. Masonry--Piers Nos. 1 & 4 (M-L11 60/3)

10. Masonry--Piers Nos. 2 & 3 (M-L11 60/4)
11. Reinforcing--Piers Nos. 1 & 2 (M-L11 60/5)
12. Reinforcing--Piers Nos. 3 & 4 (M-L11 60/6)
13. Reinforcing Schedule & Slab Details (M-L11 60/7)
14. Approach Span & Abutment (M-L11 60/8)
15. 160'-0" Truss (M-L11 60/9)
16. 160'-0" Truss (M-L11 60/10)
17. Structural Details (M-L11 60/11)
18. Structural Details (M-L11 60/12)
19. Connection Detail at Intersection (M-L11 60/13)

BIBLIOGRAPHY

Ames, Iowa. Iowa Department of Transportation. Eagle Point Bridge, Inspection Files.

Brush, John E. The Trade Centers of Southwestern Wisconsin: An Analysis of Function and Location. Madison, Wisconsin, 1952.

Childs, C. History of Dubuque County, Iowa. Chicago: Western Historical Association, 1880.

Dennett, Muessig & Associates, Ltd. "Bridges over the Mississippi and Missouri Rivers to Iowa." Iowa City, 1982. (Typewritten.)

Dubuque, Iowa. Loras College. Dubuque and Wisconsin Bridge Company Papers.

Dubuque Daily Herald, 20 March 1886; 1894-1895; 1899-1900.

Dubuque Daily Times, 1901.

Dubuque Enterprise, 27 April 1902.

Dubuque Globe-Journal, 1901-1902.

Dubuque Telegraph-Herald, 1901-1902; 9 December 1903; 1906-1907; 2 July 1918; 26 December 1954; 2 February 1973; 2 October 1977.

Dubuque Telegraph-Herald, "The Story of the Wisconsin Bridge," undated.

Dubuque Times, November 1901-April 1902.

Dubuque Times-Herald, March-April 1907.

Dubuque Times-Journal, March-April 1907.

Dubuque Trade Journal, May 1897; May 1902.

Dubuque Weekly Times, 1902.

The Engineer, 1 October 1897, p. 330.

Evans, John Henry. "Reminiscences of Early Grant County." In Three Chapters in Wisconsin Local History, pp. 232-245. Madison: Wisconsin Historical Society, 1910.

"Final Cost Report, Bridge Alterations, Dubuque, Iowa," February 1937, U.S. Army Corps of Engineers, Rock Island District. (Mimeographed.)

Maltby, F. B. "The Mississippi River Bridges." Journal of the Western Society of Engineers 8 (1903): 418-493.

Mechanicsburg, Pennsylvania. Modjeski and Masters, Consulting Engineers. Eagle Point Bridge Inspection Files.

Moore, Charles. Daniel H. Burnham. New York: Houghton Mifflin Co., 1921.

National Cyclopaedia of American Biography. Ann Arbor: University Microfilms, 1967. (reprint of 1892 edition)

New York Times, 5 June 1924, p.21.

Oldt, Franklin T., ed. History of Dubuque County, Iowa. Chicago: Goodspeed Historical Association, 1911.

Plowden, David. Bridges: The Spans of North America. New York: Viking Press, 1974.

Rohrbough, Malcolm J. The Trans-Appalachian Frontier. New York: Oxford University Press, 1978.

Shafer, Joseph. The Wisconsin Lead Region. Madison: State Historical Society of Wisconsin, 1932.

Sommer, Lawrence J. The Heritage of Dubuque. Dubuque: First National Bank of Dubuque, 1975.

Vaassen, Paul J. "Dubuque Bridges," Loras College, Dubuque, Iowa, Typescript, 20 May 1953.